



**THE DATASHEET OF  
MAX4592CSE+T**





# High-Speed, Single-Supply, Quad, SPST Analog Switches

MAX4591/MAX4592/MAX4593

## General Description

The MAX4591/MAX4592/MAX4593 are high-speed, precision, quad, single-pole/single-throw (SPST) analog switches designed to operate at +12V or +15V. The MAX4591 has four normally closed (NC) switches, and the MAX4592 has four normally open (NO) switches. The MAX4593 has two NO and two NC switches. All three devices offer low leakage (100pA max) and fast switching speeds ( $t_{ON} \leq 80ns$ ,  $t_{OFF} \leq 45ns$ ).

With a +12V supply, the MAX4591/MAX4592/MAX4593 offer guaranteed  $1\Omega$  max channel-to-channel matching,  $20\Omega$  max on-resistance ( $R_{ON}$ ), and  $1.75\Omega$  max  $R_{ON}$  flatness over the specified range.

These switches are also fully specified for single +15V operation, with  $16\Omega$  max  $R_{ON}$ ,  $1.5\Omega$  max  $R_{ON}$  match, and  $1.5\Omega$  max flatness. For low-voltage or dual-supply operation, refer to the MAX391 data sheet.

These low-voltage switches also offer 5pC max charge injection, and electrostatic discharge (ESD) protection is greater than 2000V, per Method 3015.7.

## Applications

Test Equipment	Sample-and-Hold Circuits
Disk Drives	Guidance and Control Systems
Tape Drives	Military Radios
Audio and Video	Communications Systems
Switching	PBX, PABX
Heads-Up Displays	

## Features

- ◆ Low  $16\Omega$  On-Resistance
- ◆ Fast Switching Times:  $t_{ON} = 50ns$ ,  $t_{OFF} = 30ns$
- ◆ Guaranteed  $1\Omega$  max On-Resistance Match Between Channels
- ◆ Guaranteed  $1.75\Omega$  max On-Resistance Flatness over Signal Range
- ◆ Guaranteed 5pC max Charge Injection
- ◆ Improved Leakage over Temperature: 5nA max at +85°C
- ◆ ESD >2000V per Method 3015.7
- ◆ +12V or +15V Single-Supply Operation
- ◆ Pin Compatible with DG611/DG612/DG613, DG211/DG212/DG213

## Ordering Information

PART	TEMP. RANGE	PIN-PACKAGE
MAX4591CUE	0°C to +70°C	16 TSSOP
MAX4591CSE	0°C to +70°C	16 Narrow SO
MAX4591CPE	0°C to +70°C	16 Plastic DIP
MAX4591EUE	-40°C to +85°C	16 TSSOP
MAX4591ESE	-40°C to +85°C	16 Narrow SO
MAX4591EPE	-40°C to +85°C	16 Plastic DIP

Ordering Information continued at end of data sheet.

## Pin Configurations/Functional Diagrams/Truth Tables

TOP VIEW

**TSSOP/SO/DIP**

MAX4591	
LOGIC	SWITCH
0	ON
1	OFF

N.C. = NO CONNECTION

**TSSOP/SO/DIP**

MAX4592	
LOGIC	SWITCH
0	OFF
1	ON

SWITCHES SHOWN FOR LOGIC "0" INPUT

**TSSOP/SO/DIP**

MAX4593		
LOGIC	SWITCHES 1, 4	SWITCHES 2, 3
0	OFF	ON
1	ON	OFF



# High-Speed, Single-Supply, Quad, SPST Analog Switches

## ABSOLUTE MAXIMUM RATINGS

V+ to GND .....	-0.3V to +17V
VIN_, VCOM_, VNC_, VNO_ (Note 1) .....	V- to V+
Current (any terminal) .....	30mA
Peak Current, COM_, NO_, NC_ (pulsed at 1ms, 10% duty cycle max) .....	100mA
ESD per Method 3015.7 .....	>2000V
Continuous Power Dissipation (TA = +70°C) 16-Pin TSSOP (derate 5.70mW/°C above +70°C) .....	457mW

16-Pin Narrow SO (derate 8.70mW/°C above +70°C) .....	696mW
16-Pin Plastic DIP (derate 10.53mW/°C above +70°C) .....	842mW
Operating Temperature Ranges	
MAX459_C_E .....	0°C to +70°C
MAX459_E_E .....	-40°C to +85°C
Storage Temperature Range .....	-65°C to +150°C
Lead Temperature (soldering, 10s) .....	+300°C

**Note 1:** Signals on NC\_, NO\_, COM\_, or IN\_ exceeding V+ or V- are clamped by internal diodes. Limit forward diode current to maximum current rating.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## ELECTRICAL CHARACTERISTICS—Single +12V Supply

(V+ = +12V, V- = GND = 0, VINH = 5V, VINL = 0.8V, TA = TMIN to TMAX, unless otherwise noted. Typical values are at TA = +25°C.) (Note 2)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>ANALOG SWITCH</b>						
Analog Signal Range	VCOM_, VNO_, VNC_	(Note 3)	C, E	V-	V+	V
On-Resistance	RON	ICOM_ = -10mA, VNO_ or VNC_ = 10V	TA = +25°C C, E	16 20	24	Ω
On-Resistance Match Between Channels (Note 4)	ΔRON	ICOM_ = -10mA, VNO_ or VNC_ = 10V	TA = +25°C C, E	0.5	1 1.5	Ω
On-Resistance Flatness (Note 5)	RFLAT(ON)	ICOM_ = -10mA; VNO_ or VNC_ = 3V, 6V, 9V	TA = +25°C C, E	1	1.75 2	Ω
NO or NC Off-Leakage Current (Note 6)	INO_(OFF) or INC_(OFF)	V+ = 15.5V; VCOM_ = 14V, 1V; VNO_ or VNC_ = 1V, 14V	TA = +25°C C, E	-0.1 -5	0.01 5	0.1 nA
COM Off-Leakage Current (Note 6)	ICOM_(OFF)	V+ = 15.5V; VCOM_ = 14V, 1V; VNO_ or VNC_ = 1V, 14V	TA = +25°C C, E	-0.1 -5	0.01 5	0.1 nA
COM On-Leakage Current (Note 6)	ICOM_(ON)	V+ = 15.5V; VCOM_ = 14V, 1V; VNO_ or VNC_ = 14V, 1V, or floating	TA = +25°C C, E	-0.2 -10	0.01 10	0.2 nA

# High-Speed, Single-Supply, Quad, SPST Analog Switches

MAX4591/MAX4592/MAX4593

## ELECTRICAL CHARACTERISTICS—Single +12V Supply (continued)

(V+ = +12V, V- = GND = 0, VINH = 5V, VINL = 0.8V, TA = TMIN to TMAX, unless otherwise noted. Typical values are at TA = +25°C.) (Note 2)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
<b>LOGIC INPUT</b>							
Input Current with Input Voltage High	IINH	IN_ = V+, all others = 0.8V		-0.5	0.005	0.5	μA
Input Current with Input Voltage Low	IINL	IN_ = 0.8V, all others = V+		-0.5	0.005	0.5	μA
<b>DYNAMIC</b>							
Turn-On Time	tON	VCOM_ = 10V, Figure 2	TA = +25°C	50	80		ns
			C, E		90		
Turn-Off Time	tOFF	VCOM_ = 10V, Figure 2	TA = +25°C	30	45		ns
			C, E		50		
Break-Before-Make Time Delay (Note 3)	tD	MAX4593 only, RL = 300Ω, CL = 35pF, Figure 3		5	20		ns
Charge Injection (Note 3)	Q	CL = 1nF, VGEN = 0, RGEN = 0Ω, Figure 4	TA = +25°C		2	5	pC
Off-Isolation (Note 7)	OIRR	RL = 50Ω, CL = 5pF, f = 10MHz, Figure 5	TA = +25°C		72		dB
Crosstalk (Note 8)		RL = 50Ω, CL = 5pF, f = 10MHz, Figure 6	TA = +25°C		85		dB
NC_ or NO_ Capacitance	C(OFF)	f = 1MHz, Figure 7	TA = +25°C		9		pF
COM_ Off-Capacitance	CCOM_(OFF)	f = 1MHz, Figure 7	TA = +25°C		9		pF
COM_ On-Capacitance	CCOM_(ON)	f = 1MHz, Figure 8	TA = +25°C		22		pF
<b>SUPPLY</b>							
Power-Supply Range				3		16	V
Positive Supply Current	I+	V+ = 15V, VINL = 0 or V+, all channels on or off	C, E	-1	0.001	1	μA

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## ELECTRICAL CHARACTERISTICS—Single +15V Supply

(V+ = +15V, V- = GND = 0, VINH = 5V, VINL = 0.8V, TA = TMIN to TMAX, unless otherwise noted. Typical values are at TA = +25°C.) (Note 2)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
<b>ANALOG SWITCH</b>							
Analog Signal Range	VCOM-, VNO-, VNC-	(Note 3)		0		V+	V
On-Resistance	RON	ICOM- = -10mA, VNO- or VNC- = 10V	TA = +25°C	12	16		Ω
			C, E		2.0		
On-Resistance Match Between Channels (Notes 3, 4)	ΔRON	ICOM- = -10mA, VNO- or VNC- = 10V	TA = +25°C	0.5	1.5		Ω
			C, E		2.0		
On-Resistance Flatness (Notes 3, 5)	RFLAT(ON)	ICOM- = -10mA; VNO- or VNC- = 3V, 6V, 9V	TA = +25°C	0.7	1.5		Ω
			C, E		2.0		
NO- or NC- Off-Leakage Current (Note 6)	INO-(OFF) or INC-(OFF)	V+ = 15.5V; VCOM- = 14V, 1V; VNO- or VNC- = 1V, 14V	TA = +25°C	-0.1	0.01	0.1	nA
			C, E	-5		5	
COM- Off-Leakage Current (Note 6)	ICOM-(OFF)	V+ = 15.5V; VCOM- = 14V, 1V; VNO- or VNC- = 1V, 14V	TA = +25°C	-0.1	0.01	0.1	nA
			C, E	-5		5	
COM- On-Leakage Current (Note 6)	ICOM-(ON)	V+ = 15.5V; VCOM- = 14V, 1V; VNO- or VNC- = 14V, 1V, or floating	TA = +25°C	-0.2	0.02	0.2	nA
			C, E	-10		10	
<b>DYNAMIC</b>							
Turn-On Time	tON	VNO- or VNC- = 10V, Figure 2	TA = +25°C	60	80		ns
			C, E		90		
Turn-Off Time	tOFF	VNO- or VNC- = 10V, Figure 2	TA = +25°C	30	40		ns
			C, E		50		
Break-Before-Make Time Delay (Note 3)	tD	MAX4593 only, RL = 300Ω, CL = 35pF		5	20		ns
Charge Injection (Note 3)	Q	CL = 1nF, VGEN = 0, RGEN = 0Ω, Figure 4	TA = +25°C		2	5	pC
<b>SUPPLY</b>							
Positive Supply Current	I+	V+ = 15V, VINL = 0 or V+, all channels on or off		-1	0.001	1	μA
Negative Supply Current	I-	V+ = 15V, VINL = 0 or V+, all channels on or off		-1	0.001	1	μA

**Note 2:** The algebraic convention, where the most negative value is a minimum and the most positive value a maximum, is used in this data sheet.

**Note 3:** Guaranteed by design.

**Note 4:** ΔRON = ΔRON max - ΔRON min.

**Note 5:** Flatness is defined as the difference between the maximum and minimum value of on-resistance as measured over the specified analog signal range.

**Note 6:** Leakage parameters are 100% tested at maximum rated hot temperature and guaranteed by correlation at +25°C.

**Note 7:** Off-isolation = 20log10 [VCOM / (VNC or VNO)], VCOM = output, VNC or VNO = input to off switch.

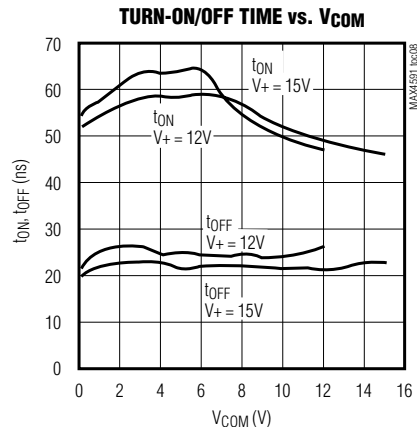
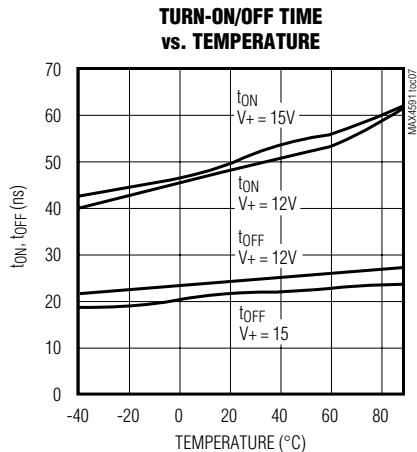
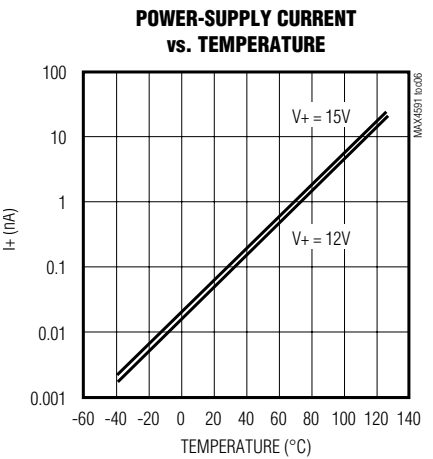
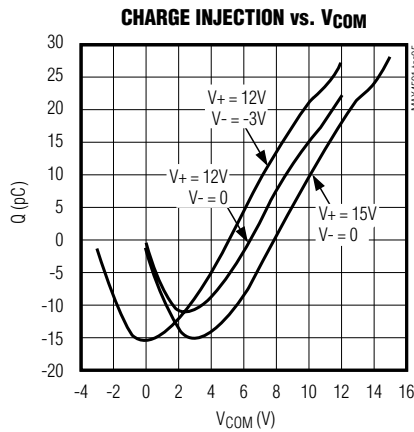
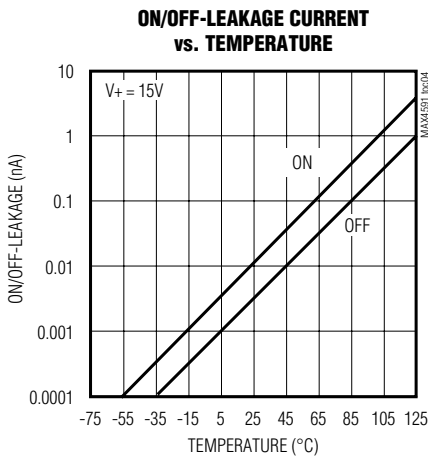
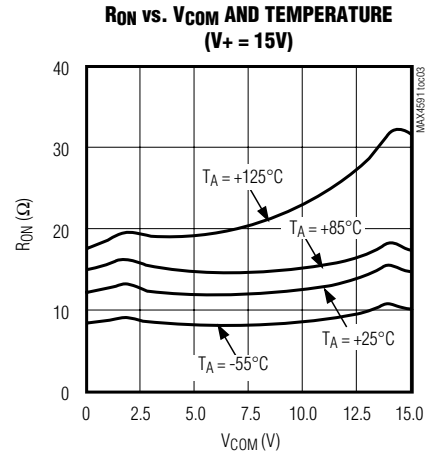
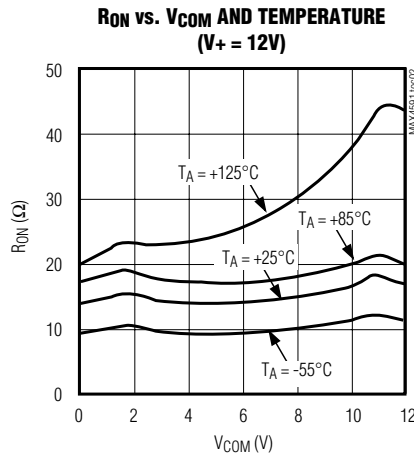
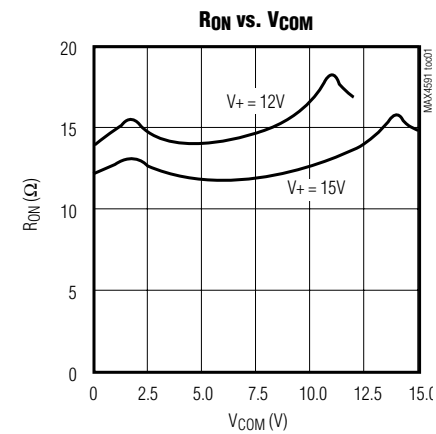
**Note 8:** Between any two switches.

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Typical Operating Characteristics

( $V_- = \text{GND} = 0$ ,  $\text{IN}_- = 0$  or  $V_+$ ,  $T_A = +25^\circ\text{C}$ , unless otherwise noted.)

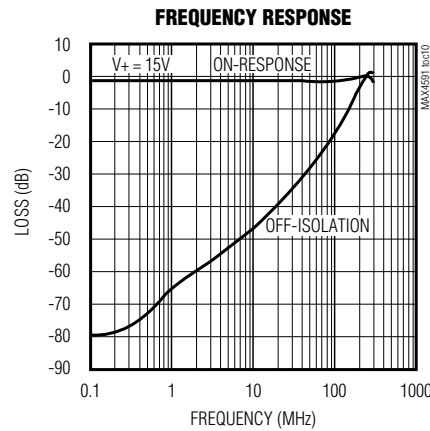
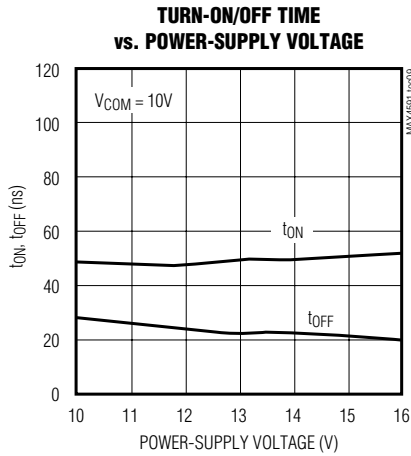
MAX4591/MAX4592/MAX4593



# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Typical Operating Characteristics (continued)

(V<sub>-</sub> = GND = 0, I<sub>N</sub> = 0 or V<sub>+</sub>, T<sub>A</sub> = +25°C, unless otherwise noted.)



## Pin Description

PIN	NAME	FUNCTION
1, 16, 9, 8	IN1–IN4	Switch Input Terminals. Drive ≤ 0.8V for logic “0”; drive ≥ 5V for logic “1”.
2, 15, 10, 7	COM1–COM4	Analog Switch Common Terminal
3, 14, 11, 6	NO1–NO4 or NC1–NC4	Switch Inputs
4	V-	Negative Supply Voltage Input. Normally connected to ground.
5	GND	Ground
12	N.C.	No Connection. Not internally connected.
13	V+	Positive Supply Voltage Input. Connected to substrate.

## Applications Information

### Overvoltage Protection

Proper power-supply sequencing is recommended for all CMOS devices. Do not exceed the absolute maximum ratings because stresses beyond the listed ratings may cause permanent damage to the devices. Always sequence V<sub>+</sub> on first, followed by the logic inputs. If power-supply sequencing is not possible, add a small signal diode in series with V<sub>+</sub> for overvoltage protection (Figure 1). Adding a diode reduces the analog signal range to 1V below V<sub>+</sub>, but low switch resistance and low leakage characteristics are unaffected. Device operation is unchanged, and the difference between V<sub>+</sub> and V<sub>-</sub> should not exceed 17V.

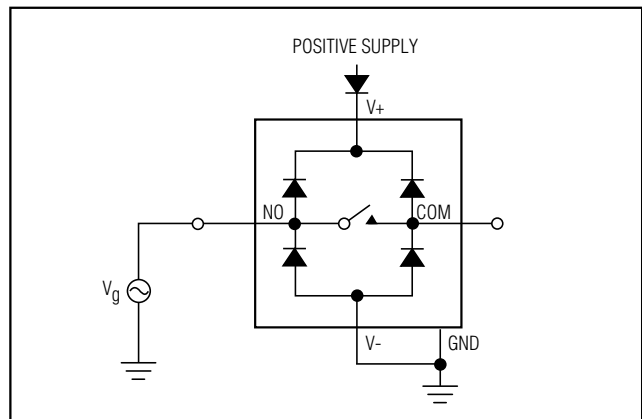


Figure 1. Overvoltage Protection Using Two External Blocking Diodes

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Test Circuits/Timing Diagrams

MAX4591/MAX4592/MAX4593

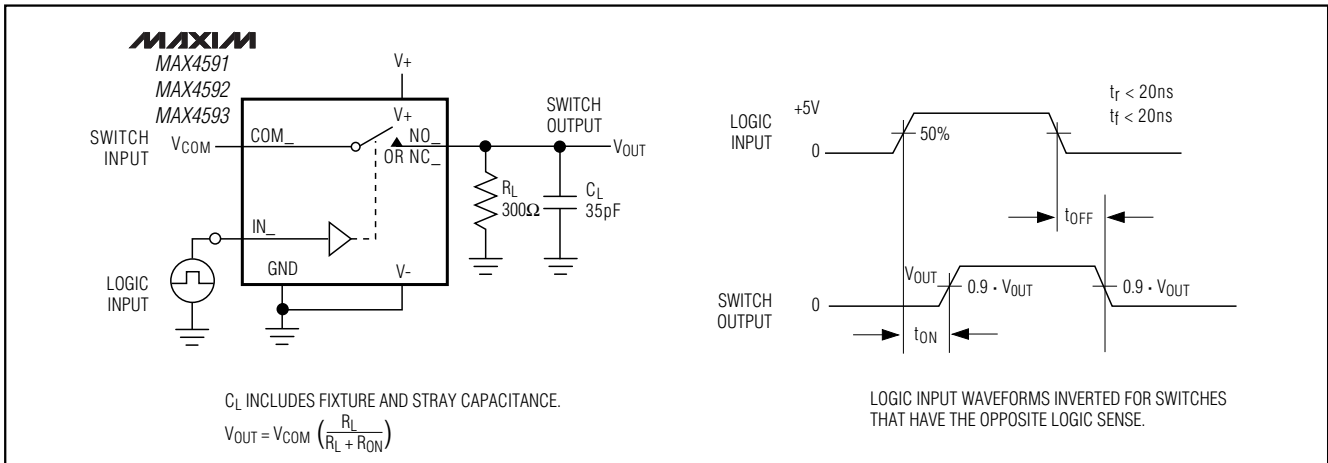


Figure 2. Switching Time

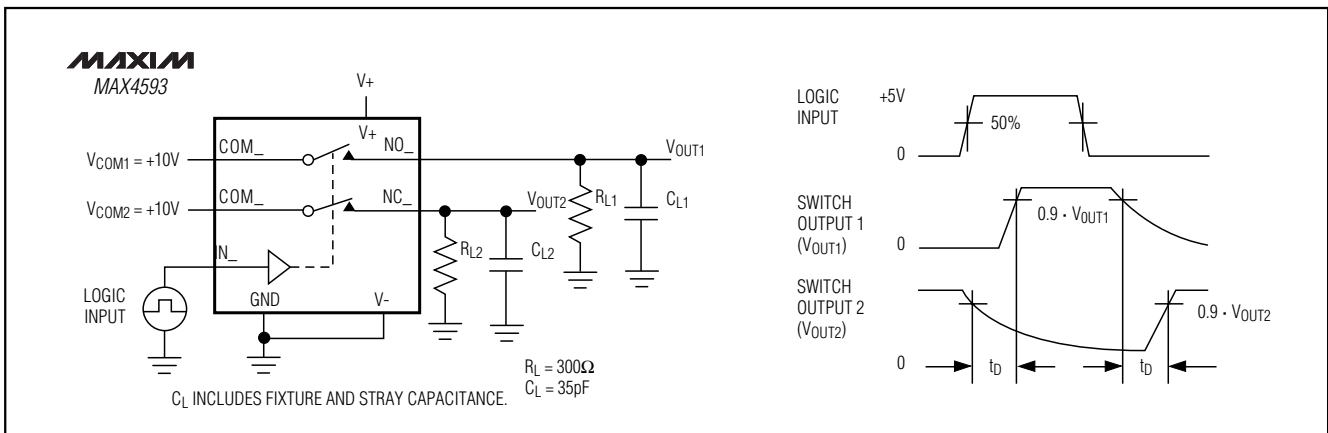


Figure 3. Break-Before-Make Interval (MAX4593 Only)

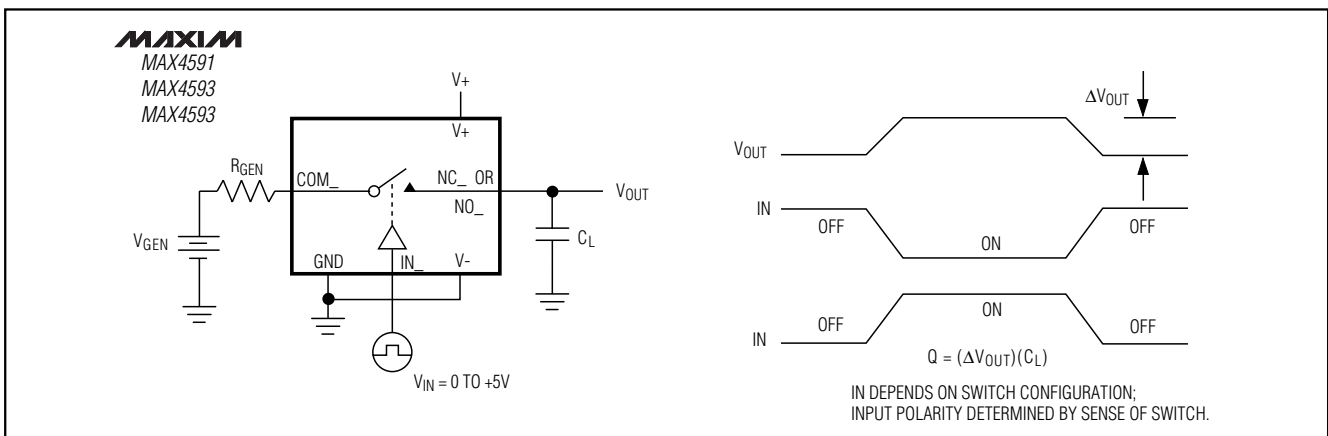


Figure 4. Charge Injection

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Test Circuits/Timing Diagrams (continued)

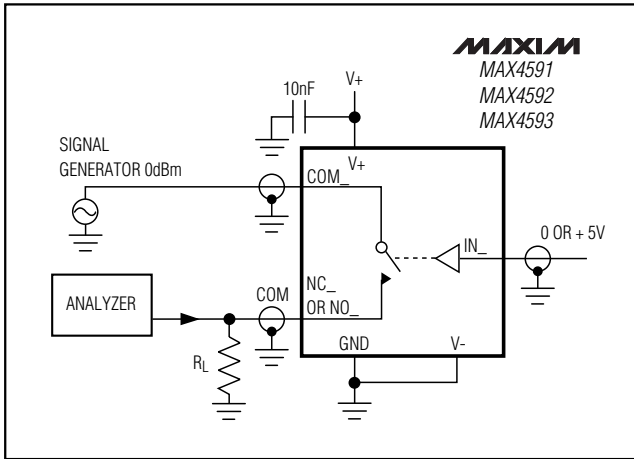


Figure 5. Off-Isolation

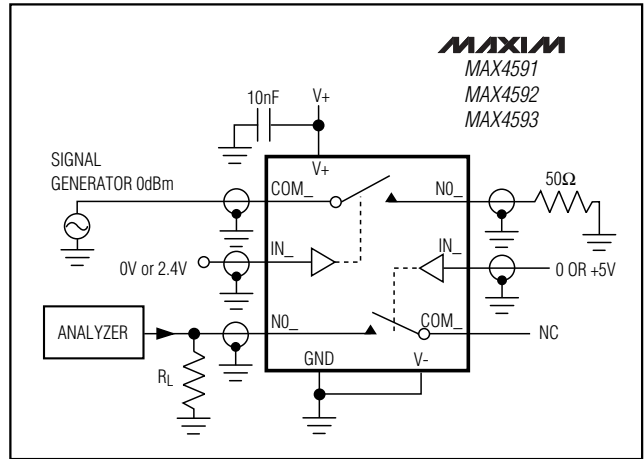


Figure 6. Crosstalk

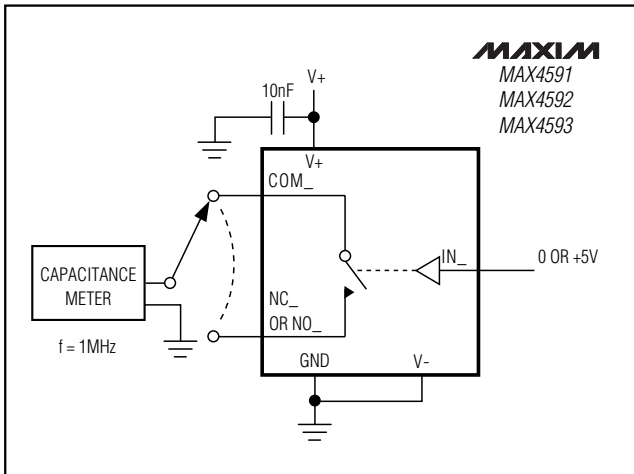


Figure 7. Channel Off-Capacitance

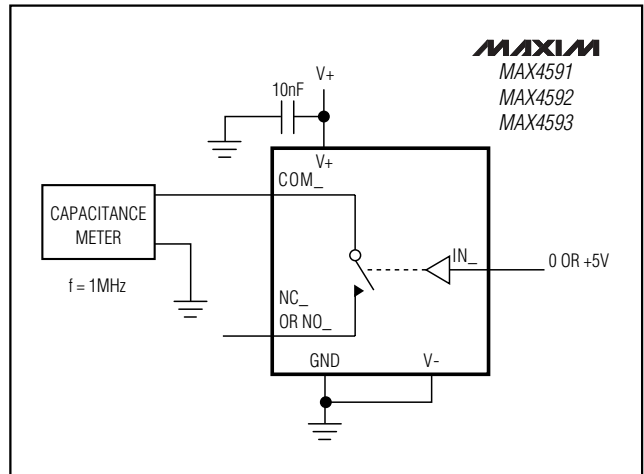


Figure 8. Channel On-Capacitance

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Ordering Information (continued)

PART	TEMP. RANGE	PIN-PACKAGE
MAX4592CUE	0°C to +70°C	16 TSSOP
MAX4592CSE	0°C to +70°C	16 Narrow SO
MAX4592CPE	0°C to +70°C	16 Plastic DIP
MAX4592EUE	-40°C to +85°C	16 TSSOP
MAX4592ESE	-40°C to +85°C	16 Narrow SO
MAX4592EPE	-40°C to +85°C	16 Plastic DIP
MAX4593CUE	0°C to +70°C	16 TSSOP
MAX4593CSE	0°C to +70°C	16 Narrow SO
MAX4593CPE	0°C to +70°C	16 Plastic DIP
MAX4593EUE	-40°C to +85°C	16 TSSOP
MAX4593ESE	-40°C to +85°C	16 Narrow SO
MAX4593EPE	-40°C to +85°C	16 Plastic DIP

## Chip Information

TRANSISTOR COUNT: 76

MAX4591/MAX4592/MAX4593

## Package Information

DIMENSION				SYMBOL			
UNIT	MILLIMETERS	INCHES	UNIT	MILLIMETERS	INCHES	UNIT	MILLIMETERS
1	1.27	0.050	2	0.25	0.010	3	0.25
4	0.25	0.010	5	0.25	0.010	6	0.25
7	0.25	0.010	8	0.25	0.010	9	0.25
10	0.25	0.010	11	0.25	0.010	12	0.25
13	0.25	0.010	14	0.25	0.010	15	0.25
16	0.25	0.010	17	0.25	0.010	18	0.25
19	0.25	0.010	20	0.25	0.010	21	0.25
22	0.25	0.010	23	0.25	0.010	24	0.25
25	0.25	0.010	26	0.25	0.010	27	0.25
28	0.25	0.010	29	0.25	0.010	30	0.25
31	0.25	0.010	32	0.25	0.010	33	0.25
34	0.25	0.010	35	0.25	0.010	36	0.25
37	0.25	0.010	38	0.25	0.010	39	0.25
40	0.25	0.010	41	0.25	0.010	42	0.25
43	0.25	0.010	44	0.25	0.010	45	0.25
46	0.25	0.010	47	0.25	0.010	48	0.25
49	0.25	0.010	50	0.25	0.010	51	0.25
52	0.25	0.010	53	0.25	0.010	54	0.25
55	0.25	0.010	56	0.25	0.010	57	0.25
58	0.25	0.010	59	0.25	0.010	60	0.25
61	0.25	0.010	62	0.25	0.010	63	0.25
64	0.25	0.010	65	0.25	0.010	66	0.25
67	0.25	0.010	68	0.25	0.010	69	0.25
70	0.25	0.010	71	0.25	0.010	72	0.25
73	0.25	0.010	74	0.25	0.010	75	0.25
76	0.25	0.010	77	0.25	0.010	78	0.25
79	0.25	0.010	80	0.25	0.010	81	0.25
82	0.25	0.010	83	0.25	0.010	84	0.25
85	0.25	0.010	86	0.25	0.010	87	0.25
88	0.25	0.010	89	0.25	0.010	90	0.25
91	0.25	0.010	92	0.25	0.010	93	0.25
94	0.25	0.010	95	0.25	0.010	96	0.25
97	0.25	0.010	98	0.25	0.010	99	0.25
100	0.25	0.010	101	0.25	0.010	102	0.25
103	0.25	0.010	104	0.25	0.010	105	0.25
106	0.25	0.010	107	0.25	0.010	108	0.25
109	0.25	0.010	110	0.25	0.010	111	0.25
112	0.25	0.010	113	0.25	0.010	114	0.25
115	0.25	0.010	116	0.25	0.010	117	0.25
118	0.25	0.010	119	0.25	0.010	120	0.25
121	0.25	0.010	122	0.25	0.010	123	0.25
124	0.25	0.010	125	0.25	0.010	126	0.25
127	0.25	0.010	128	0.25	0.010	129	0.25
130	0.25	0.010	131	0.25	0.010	132	0.25
133	0.25	0.010	134	0.25	0.010	135	0.25
136	0.25	0.010	137	0.25	0.010	138	0.25
139	0.25	0.010	140	0.25	0.010	141	0.25
142	0.25	0.010	143	0.25	0.010	144	0.25
145	0.25	0.010	146	0.25	0.010	147	0.25
148	0.25	0.010	149	0.25	0.010	150	0.25
151	0.25	0.010	152	0.25	0.010	153	0.25
154	0.25	0.010	155	0.25	0.010	156	0.25
157	0.25	0.010	158	0.25	0.010	159	0.25
160	0.25	0.010	161	0.25	0.010	162	0.25
163	0.25	0.010	164	0.25	0.010	165	0.25
166	0.25	0.010	167	0.25	0.010	168	0.25
169	0.25	0.010	170	0.25	0.010	171	0.25
172	0.25	0.010	173	0.25	0.010	174	0.25
175	0.25	0.010	176	0.25	0.010	177	0.25
178	0.25	0.010	179	0.25	0.010	180	0.25
181	0.25	0.010	182	0.25	0.010	183	0.25
184	0.25	0.010	185	0.25	0.010	186	0.25
187	0.25	0.010	188	0.25	0.010	189	0.25
190	0.25	0.010	191	0.25	0.010	192	0.25
193	0.25	0.010	194	0.25	0.010	195	0.25
196	0.25	0.010	197	0.25	0.010	198	0.25
199	0.25	0.010	200	0.25	0.010	201	0.25
202	0.25	0.010	203	0.25	0.010	204	0.25
205	0.25	0.010	206	0.25	0.010	207	0.25
208	0.25	0.010	209	0.25	0.010	210	0.25
211	0.25	0.010	212	0.25	0.010	213	0.25
214	0.25	0.010	215	0.25	0.010	216	0.25
217	0.25	0.010	218	0.25	0.010	219	0.25
220	0.25	0.010	221	0.25	0.010	222	0.25
223	0.25	0.010	224	0.25	0.010	225	0.25
226	0.25	0.010	227	0.25	0.010	228	0.25
229	0.25	0.010	230	0.25	0.010	231	0.25
232	0.25	0.010	233	0.25	0.010	234	0.25
235	0.25	0.010	236	0.25	0.010	237	0.25
238	0.25	0.010	239	0.25	0.010	240	0.25
241	0.25	0.010	242	0.25	0.010	243	0.25
244	0.25	0.010	245	0.25	0.010	246	0.25
247	0.25	0.010	248	0.25	0.010	249	0.25
250	0.25	0.010	251	0.25	0.010	252	0.25
253	0.25	0.010	254	0.25	0.010	255	0.25
256	0.25	0.010	257	0.25	0.010	258	0.25
259	0.25	0.010	260	0.25	0.010	261	0.25
262	0.25	0.010	263	0.25	0.010	264	0.25
265	0.25	0.010	266	0.25	0.010	267	0.25
268	0.25	0.010	269	0.25	0.010	270	0.25
271	0.25	0.010	272	0.25	0.010	273	0.25
274	0.25	0.010	275	0.25	0.010	276	0.25
277	0.25	0.010	278	0.25	0.010	279	0.25
280	0.25	0.010	281	0.25	0.010	282	0.25
283	0.25	0.010	284	0.25	0.010	285	0.25
286	0.25	0.010	287	0.25	0.010	288	0.25
289	0.25	0.010	290	0.25	0.010	291	0.25
292	0.25	0.010	293	0.25	0.010	294	0.25
295	0.25	0.010	296	0.25	0.010	297	0.25
298	0.25	0.010	299	0.25	0.010	300	0.25
301	0.25	0.010	302	0.25	0.010	303	0.25
304	0.25	0.010	305	0.25	0.010	306	0.25
307	0.25	0.010	308	0.25	0.010	309	0.25
310	0.25	0.010	311	0.25	0.010	312	0.25
313	0.25	0.010	314	0.25	0.010	315	0.25
316	0.25	0.010	317	0.25	0.010	318	0.25
319	0.25	0.010	320	0.25	0.010	321	0.25
322	0.25	0.010	323	0.25	0.010	324	0.25
325	0.25	0.010	326	0.25	0.010	327	0.25
328	0.25	0.010	329	0.25	0.010	330	0.25
331	0.25	0.010	332	0.25	0.010	333	0.25
334	0.25	0.010	335	0.25	0.010	336	0.25
337	0.25	0.010	338	0.25	0.010	339	0.25
340	0.25	0.010	341	0.25	0.010	342	0.25
343	0.25	0.010	344	0.25	0.010	345	0.25
346	0.25	0.010	347	0.25	0.010	348	0.25
349	0.25	0.010	350	0.25	0.010	351	0.25
352	0.25	0.010	353	0.25	0.010	354	0.25
355	0.25	0.010	356	0.25	0.010	357	0.25
358	0.25	0.010	359	0.25	0.010	360	0.25
361	0.25	0.010	362	0.25	0.010	363	0.25
364	0.25	0.010	365	0.25	0.010	366	0.25
367	0.25	0.010	368	0.25	0.010	369	0.25
370	0.25	0.010	371	0.25	0.010	372	0.25
373	0.25	0.010	374	0.25	0.010	375	0.25
376	0.25	0.010	377	0.25	0.010	378	0.25
379	0.25	0.010	380	0.25	0.010	381	0.25
382	0.25	0.010	383	0.25	0.010	384	0.25
385	0.25	0.010	386	0.25	0.010	387	0.25
388	0.25	0.010	389	0.25	0.010	390	0.25
391	0.25	0.010	392	0.25	0.010	393	0.25
394	0.25	0.010	395	0.25	0.010	396	0.25
397	0.25	0.010					

# High-Speed, Single-Supply, Quad, SPST Analog Switches

## Package Information (continued)

	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
B	0.014	0.019	0.35	0.49
C	0.007	0.010	0.19	0.25
e	0.050		1.27	
E	0.150	0.157	3.80	4.00
H	0.228	0.244	5.80	6.20
h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27

	INCHES		MILLIMETERS		N	MS012
	MIN	MAX	MIN	MAX		
D	0.189	0.197	4.80	5.00	8	A
D	0.337	0.344	8.55	8.75	14	B
D	0.386	0.394	9.80	10.00	16	C

NOTES:  
 1. D&E DO NOT INCLUDE MOLD FLASH  
 2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")  
 3. LEADS TO BE COPLANAR WITHIN .102mm (.004")  
 4. CONTROLLING DIMENSION: MILLIMETER  
 5. MEETS JEDEC MS012-XX AS SHOWN IN ABOVE TABLE  
 6. N = NUMBER OF PINS

**MAXIM** PACKAGE FAMILY OUTLINE: SOIC .150° 1/1 21-0041 A  
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# **High-Speed, Single-Supply, Quad, SPST Analog Switches**

## **NOTES**

*Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.*

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